

Mejorando el Intercambio de Datos Espaciales para proteger la Biosfera

del 17 al 19 de octubre



# cross nature

Cross Harmonization  
& Exploitation  
of NATURE DataSets

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- The 2016 CEF Telecom Public Open Data call makes an indicative €3.5 million of funding available for proposals in this area
- [2016 CEF Telecom Call - Public Open Data \(CEF-TC-2016-2\)](#)
- [Work programme 2016](#)
- [eSubmission by Participant Portal INEA \(sept 2016\)](#)
- Project was accepted. Selected proposal code 2016-EU-IA-0071 (28.02.2017).
- The Connecting Europe Facility (CEF) in Telecom is a key EU instrument to facilitate cross-border interaction between public administrations, businesses and citizens



- Period: 01/05/2017 to 30/04/2019 (24 months)
- Only 3 partners:
  - 1 from Portugal: DGT
  - 2 from Spain: Tragsa Group and Carlos III University of Madrid
- Main Spanish supporter: MITECO
- Budget:
  - Total Budget accepted: 960,432,00 EUR
  - Total CEF contribution: 480,216,00 EUR (50 % eligible costs)
- 5 workpackages
  - 2 Cross-cutting WPs
  - 3 Technical WPs



- ❑ Portuguese datasets: ICNF - Database of the Birds and Habitats Directives and ad-hoc databases for species or groups of species (e.g. Atlas).



*Eidos*

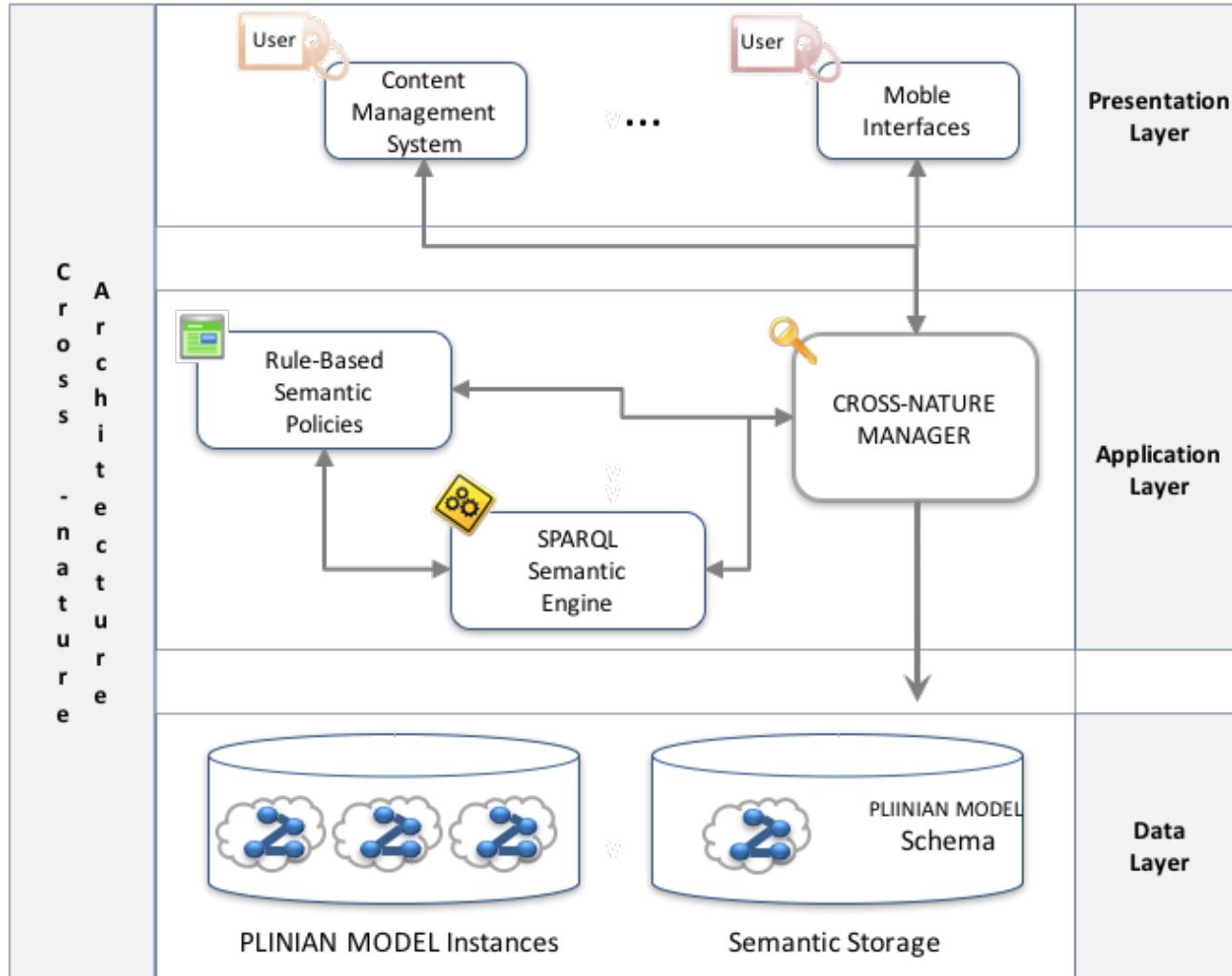


- ❑ Spanish datasets: MITECO – EIDOS

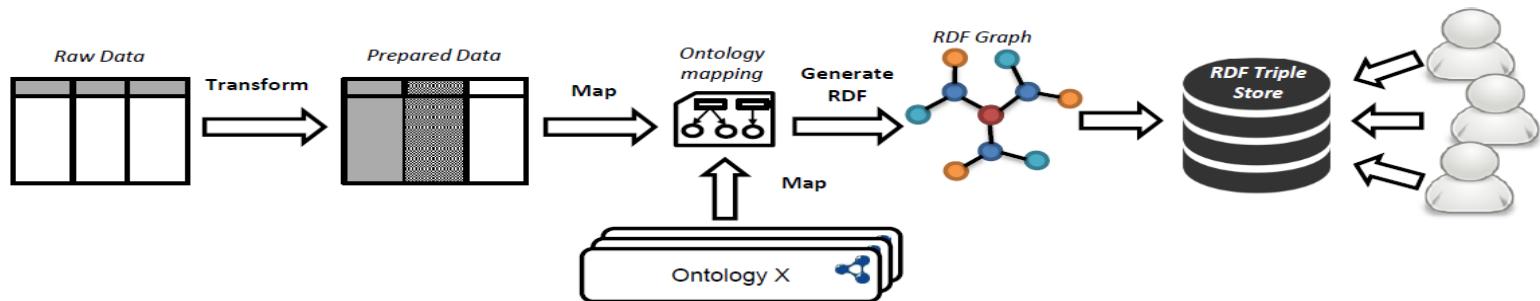
- ❑ The structure of those datasets and plinian core model (EIDOS) will be used as infrastructure for Cross-Nature Ontology
- ❑ The main objective is publishing with linked open data (LOD) technology species distribution information
- ❑ It is also necessary to follow the INSPIRE specifications for being geospatial information



□ The processed datasets will be published using the Cross-Nature Endpoint and Architecture



- To carry out the evolution of the Plinian Core standard to a semantic model will be necessary to create an ontology: a system of representation of knowledge that provides a formal and logical description understandable both by machines and humans.
- It is a crucial process in which experts in different disciplines have to intervene and define all kinds of logical relationships between the elements and meanings related to species. They will also have to select the part of the knowledge already published in this format that can enrich the ontology.
- This ontology will be expressed in standard formats defined by the World Wide Web Consortium (W3C).

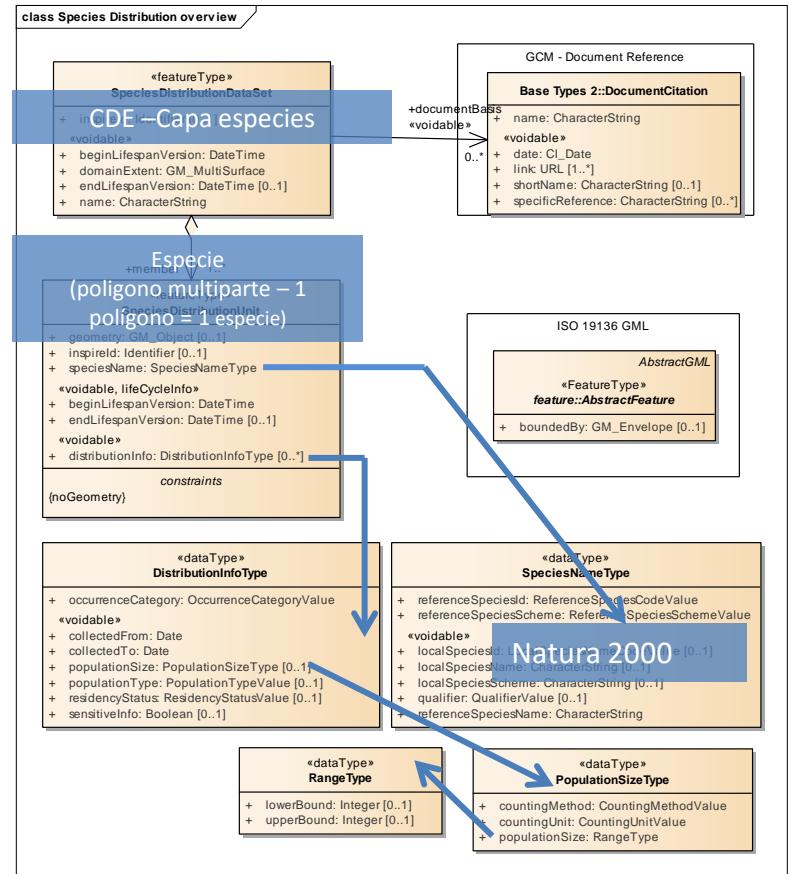




**INSPIRE**  
Infrastructure for Spatial Information in Europe

## D2.8.III.19 Data Specification on *Species Distribution* – Technical Guidelines

Title	D2.8.III.19 INSPIRE Data Specification on Species Distribution – Technical Guidelines
Creator	INSPIRE Thematic Working Group Species Distribution
Date	2013-12-10
Subject	INSPIRE Data Specification for the spatial data theme <i>Species Distribution</i>
Publisher	European Commission Joint Research Centre
Type	Text
Description	This document describes the INSPIRE Data Specification for the spatial data theme <i>Species Distribution</i>
Contributor	Members of the INSPIRE Thematic Working Group Species Distribution
Format	Portable Document Format (pdf)
Source	
Rights	Public
Identifier	D2.8.III.19_v3.0
Language	En
Relation	Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Union (INSPIRE)
Coverage	Project duration



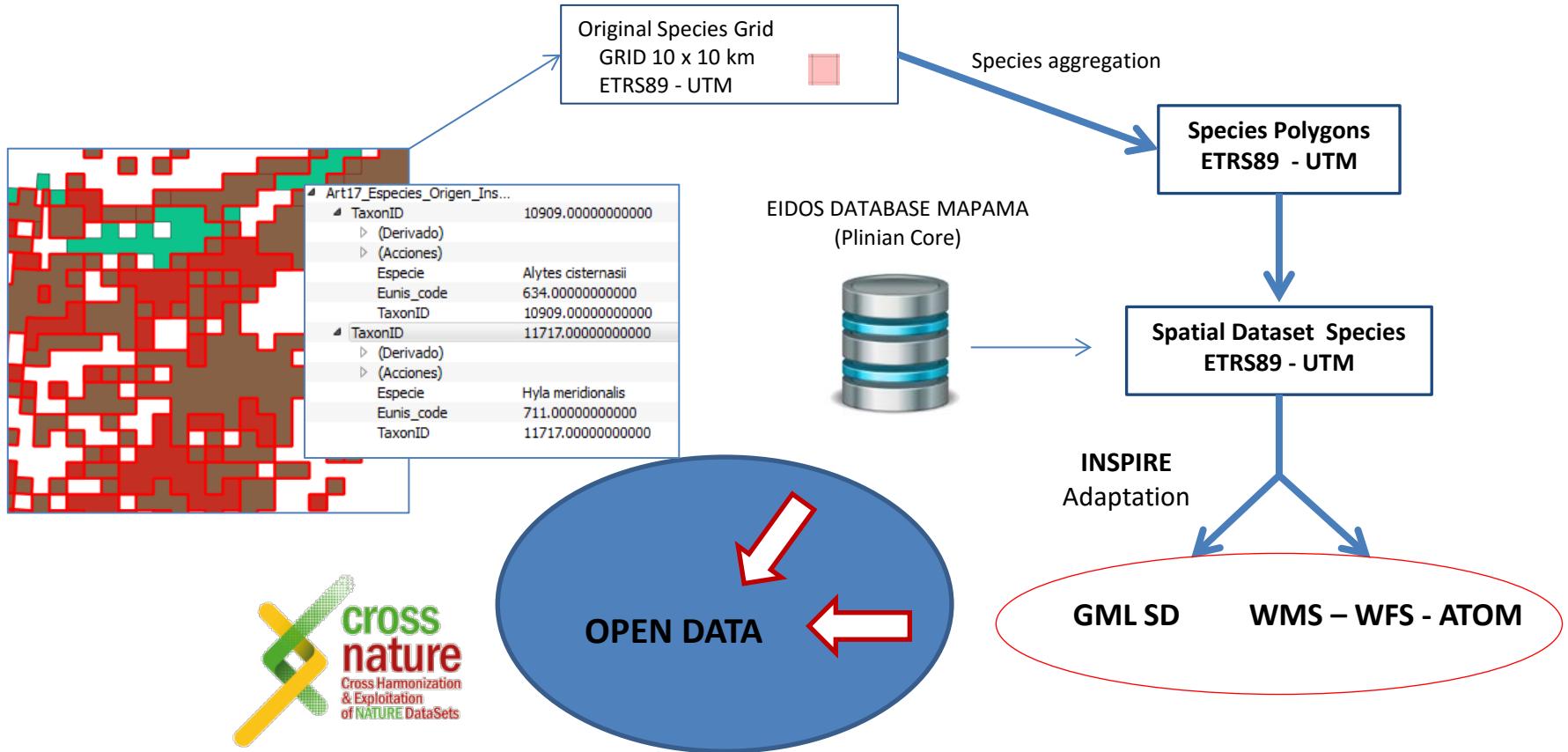
# GEOSPATIAL POINT OF VIEW; INSPIRE

INSPIRE FeatureType	MAPAMA	Data Set
Species Distribution	Species Distribution	EIDOS (Plinian Core)
geometry	GM_Object	
INSPIREID (example)	ES.IEPNB.SD_HD.Natura2000_code	
speciesName		
referenceSpeciesId	Natura2000_Code	
referenceSpeciesScheme	Natura2000	
referenceSpeciesName	Especie	
localSpeciesId	TaxonID	
localSpeciesScheme		Colecciones_MAPAMA
localSpeciesName		scientificName
qualifier		
beginLifespanVersion	2007	
endLifespanVersion	2012	

INSPIRE FeatureType	MAPAMA	Data Set
Species Distribution	Species Distribution	EIDOS (Plinian Core)
distributionInfo		
occurrenceCategory		presente
populationSize		measurementValue
residencyStatus		Origen (tabla GISINInvasiveness)
populationSize		
CountingMethod		Estimado
CountingUnitValue		adults
PopulationSize		measuremenValue
sensitiveInfo		Status (Tabla: T_Status)
populationType		(Sólo directiva AVES) measuremenType (Presencia)
collectedFrom		measurementDeterminedDate
collectedTo		measurementDeterminedDate



# PUBLISHING OPEN DATA OF SPECIES ADAPTED TO INSPIRE



- ❑ The methodology for adapting data to INSPIRE schemes and generating GMLs is well defined, but a methodology for the publication of INSPIRE data as Linked Data must still be defined.
- ❑ The methodology should cover:
  - Creation of RDF vocabularies representing the INSPIRE data models
  - Transformation of INSPIRE data into RDF
- ❑ (RDF language is based on URIs to describe concepts and avoid ambiguities)



## Guidelines for the RDF encoding of spatial data

Title	Guidelines for the RDF encoding of spatial data
Status	Draft
Creator	ARE3NA project "INSPIRE Re3ference Platform Phase 2"
Date	2017-07-17
Subject	INSPIRE encoding rules for representing spatial data as RDF
Publisher	ARE3NA project "INSPIRE Re3ference Platform Phase 2"
Type	Text
Description	This document specifies an experimental encoding rule for representing spatial data sets in INSPIRE as RDF. The use of RDF is optional and does not supersede or replace the requirements regarding encoding specified in Clause 9 of the Data Specifications. This optional encoding is intended to support the e-government and open data community in Europe, which is increasingly looking at RDF to represent data.
Format	HyperText Markup Language (HTML)
Licence	Creative Commons Attribution (cc-by) 4.0
Identifier	<a href="http://inspire-eu-rdf.github.io/inspire-rdf-guidelines">http://inspire-eu-rdf.github.io/inspire-rdf-guidelines</a>
Language	EN

[http://inspire-eu-rdf.github.io/inspire-rdf-guidelines/#ogc\\_geosparql](http://inspire-eu-rdf.github.io/inspire-rdf-guidelines/#ogc_geosparql)

# TRANSFORMATION PROCESSES GML -> RDF



ISO/DIS 19150-2

<https://www.iso.org/obp/ui/#iso:std:iso:19150:-2:ed-1:v1:en>



# PUBLICATION OF OPEN SPECIES DATA

```
SPARQL endpoint: https://virtuoso.conductor.es/rdf/endpoint

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX geo: <http://www.opengis.net/def/crs/OGC/1.3/CRS&gt;
PREFIX gml: <http://www.opengis.net/gml/>
PREFIX inspire: <http://inspire.jrc.ec.europa.eu/vocabulary/>
PREFIX nomenclature: <http://nomenclature.jrc.ec.europa.eu/vocabulary/>
PREFIX habitat: <http://habitat.jrc.ec.europa.eu/vocabulary/>
PREFIX location: <http://location.jrc.ec.europa.eu/vocabulary/>
PREFIX distribution: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionFeature: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionObservation: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionRecord: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionSpecies: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionStatus: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionValue: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionFeatureType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionStatusType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionValueType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionFeatureStatusType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionFeatureTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionStatusTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionTypeTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionValueTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionFeatureStatusTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionFeatureTypeTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionStatusTypeTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionTypeTypeTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionValueTypeTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
PREFIX distributionFeatureStatusTypeTypeType: <http://distribution.jrc.ec.europa.eu/vocabulary/>
```

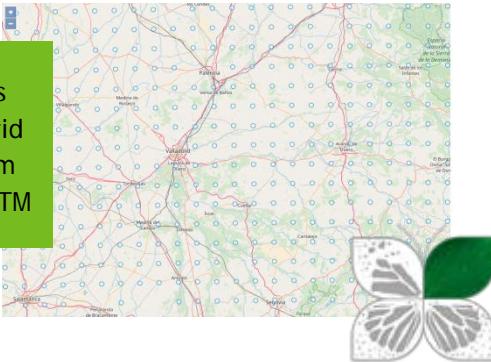
Upload of Species Distribution RDF to Endpoint



Geometry  
GML - Inspire



Centroids  
Species Grid  
10 x 10 Km  
ETRS89 - UTM



Visualization of  
RDF information



- Build RDF with spanish species distribution grid (UTM and LAEA) and EIDOS database**
- Improving geographical interface for Cross-Nature project**
- Explode the Cross-Nature end point to do a complete species sheet with all data**
- Test other possible linked data**
- GML Conversion to RDF; different strategies**
- Defining the Use Cases Apps wire-frames**



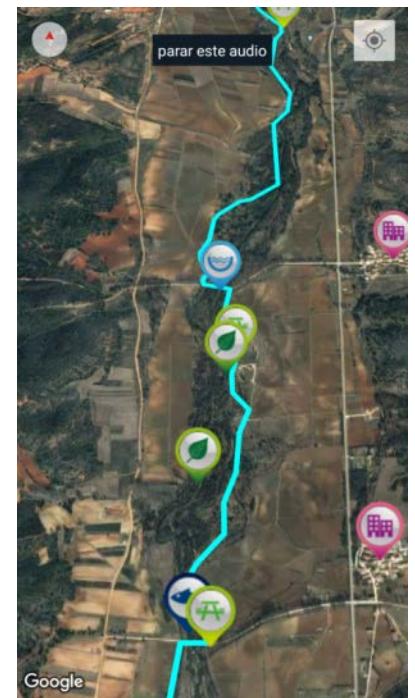
- Endpoint; Triplets server using Openlink Virtuoso software**
- Development of a web application to query the endpoint**
- Implementation of the application using JavaScript**
- Web applicaton based on OpenLayers Map**
- Geoserver for publishing a species grid via web map service**



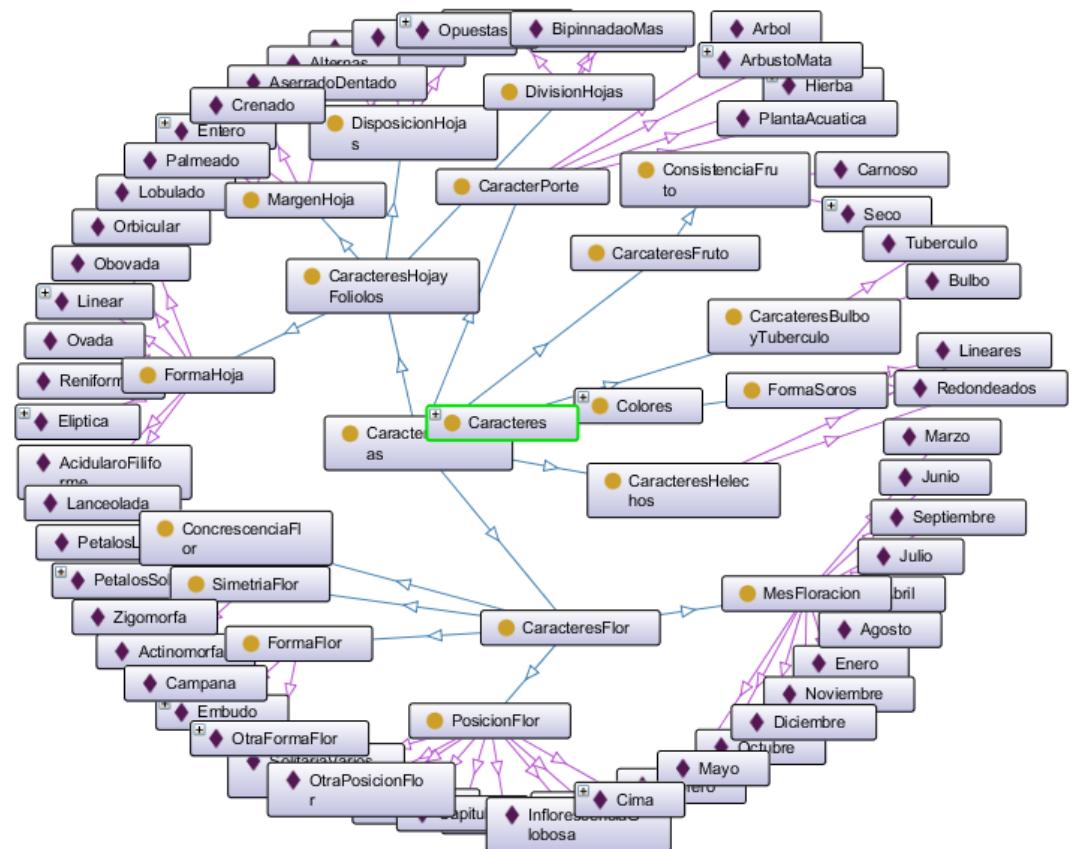
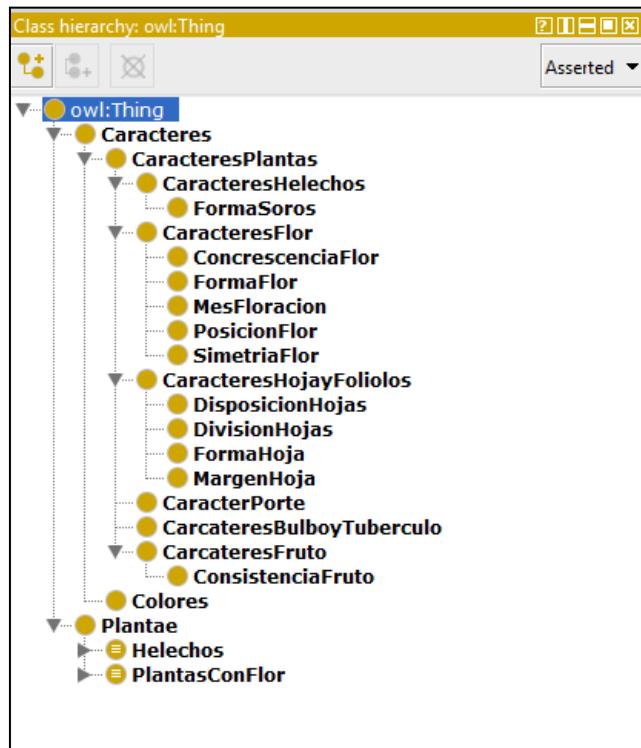
- Basic queries and analysis can be made to the endpoint**
- Useful for unique geographical queries**
- Full EIDOS ontology required for publishing**
- Possible application in the Apps of the use-cases**
- Slow interface when multiple graphical elements are selected.**



- Cross-Nature Endpoint, among others datasources, will be used by NATURE AND LANDSCAPE INTERPRETATION Apps



- Species identification Ontology

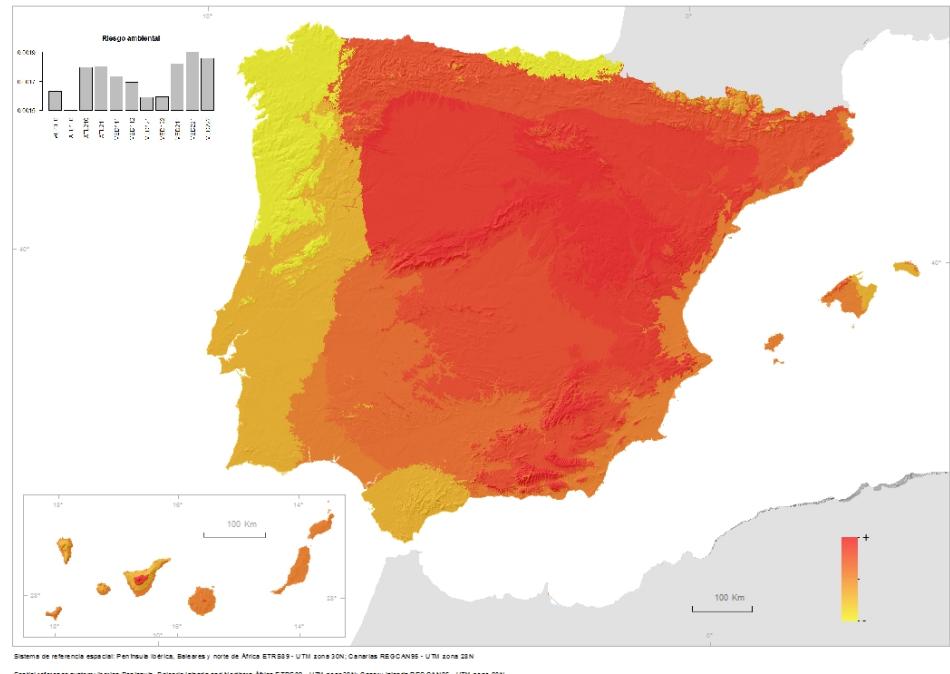


## USE CASES

❑ Cross-Nature Endpoint, among others datasources, will be used by TERRITORIAL ANALYSIS FOR THE ASSESSMENT OF INVASIVENESS RISK BY IAS

### Web portal and App:

- Map viewer with invasion risk map
- IAS distribution
- IAS datasheet
- Report IAS presence (2 phase)
- Identification of top priority areas



The screenshot shows the Cross-Nature web application interface. On the left, a dark sidebar contains the 'Cross-Nature' logo and navigation links for 'GENERAL' (Home, Eidos, Layouts), 'MORE' (Endpoints, Cross-Nature, European Environment Agency), and specific features like 'Add species' and 'Malla 10x10 UTM'. The main area features a map of Spain, Portugal, and parts of North Africa and the Mediterranean. The map includes place names like Madrid, Barcelona, Valencia, and Lisbon. A search radius slider is visible at the bottom of the map. The top bar shows the URL [www.crossnature.eu/visor/](http://www.crossnature.eu/visor/).

[www.crossnature.eu/visor](http://www.crossnature.eu/visor)



Cross-Nature

CROSS HARMONIZATION & EXPLOITATION OF NATURE DATASETS

GENERAL

- Home
- Eidos
- Layouts
  - Add species
  - Malla 10x10 UTM

MORE

- Endpoints
- Cross-Nature
- European Environment Agency

Map Success: 113 results (10kmE299N210)

Search radius (km)



Cross-Nature

Map Success 113 results (10kmE299N210)

Map

Leedesma

```
custom.min.js:40 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> PREFIX geo:
<http://www.opengis.net/ont/geosparql#> PREFIX malla: <http://crossnature.eu/def/spatialgrid#> PREFIX res:
<http://crossnature.eu/resource/Concept/> select DISTINCT * from <http://localhost:8890/grid10x10Lambert> from
<http://localhost:8890/EIDOS> where { ?cuadricula rdf:type malla:cell . ?cuadricula malla:hasCoordinateSystem
res:ETRS89_ETRS_LAEA . ?cuadricula geo:asWKT ?WKT . FILTER (bif:st_intersects(?WKT,bif:st_point(-5.768508911132811,
40.78470081841746),0))} limit 1custom.min.js:40 PREFIX plinian:<http://cross-
nature.grupotragsa.es/def/PLINIANCORE.owl#> PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> PREFIX dwc:
<http://rs.tdwg.org/dwc/terms/> PREFIX geo: <http://www.opengis.net/ont/geosparql#> PREFIX malla: <http://cross-
nature.grupotragsa.es/def/malla#> PREFIX darwin: <http://rs.tdwg.org/dwc/terms/> PREFIX res: <http://cross-
nature.grupotragsa.es/resources/malla#> select DISTINCT group_concat(?CodCelda;separator=', ') as ?CodCelda
?HigherClassification as ?higherClassification ?ScientificName as ?scientificName ?CodEunis ?SpecificEpithet as
?specificEpithet ?TaxonRecordId as ?Taxon STR(?codFototeca) as ?codFototeca from
<http://localhost:8890/Malla10x10Lambert> from <http://localhost:8890/PLINIAN2> from
<http://localhost:8890/taxon_cell_lambert> from <http://localhost:8890/fototeca> where { ?Location plinian:hasCell
?cuadricula . ?Location plinian:isLocationOf ?TaxonRecord . ?TaxonRecord <http://cross-
nature.grupotragsa.es/def/PLINIANCORE.owl#hasHierarchy> ?b . ?TaxonRecord <http://cross-
nature.grupotragsa.es/def/PLINIANCORE.owl#TaxonRecordID> ?TaxonRecordId. ?b darwin:scientificName ?ScientificName .
OPTIONAL{?TaxonRecord <http://cross-nature.grupotragsa.es/def/PLINIANCORE.owl#CodeEUNIS> ?CodEunis}.
OPTIONAL{?TaxonRecord plinian:codFototeca ?codFototeca} . OPTIONAL{?b darwin:higherClassification
?HigherClassification} . OPTIONAL{?b darwin:specificEpithet ?SpecificEpithet} { select DISTINCT ?cuadricula ?CodCelda
from <http://localhost:8890/Malla10x10Lambert> from <http://localhost:8890/PLINIAN> where { ?cuadricula rdf:type
malla:cell . ?cuadricula malla:hasCoordinateSystem res:ETRS89_ETRS_LAEA . ?cuadricula geo:asWKT ?WKT .
?cuadricula malla:cod10x10 ?CodCelda . FILTER (bif:st_intersects(?WKT,bif:st_point(-5.768508911132811,
40.78470081841746),0))} limit 1} } order by ?TaxonRecord
```

CROSS HARMONIZATION & EXPLOITATION OF NATURE DATASETS

GENERAL

Home Eidos Layouts Add species Malla 10x10 UTM

MORE

Endpoints Cross-Nature European Environment Agency



google traductor - Busca    ficha - Diccionario Inglés    Cross-Nature

www.crossnature.eu/visor/

**Cross-Nature**

CROSS HARMONIZATION & EXPLOITATION OF NATURE DATASETS

**GENERAL**

- Home
- Eidos
- Layouts
  - Add species
  - Malla 10x10 UTM

**MORE**

- Endpoints
- Cross-Nature
- European Environment Agency

Map    Success

Map    113 results (10kmE299N210)

Search

Eunis	Classification	Scientific Name	specific Epithet	Taxon	Fototeca
1149	Animalia   Chordata   Aves   Passeriformes   Motacillidae   Motacilla   alba	Motacilla alba Linnaeus, 1758	alba	10648	34866
1339	Animalia   Chordata   Aves   Strigiformes   Tytonidae   Tyto   alba	Tyto alba Scopoli, 1769	alba	10650	23392
1287	Animalia   Chordata   Aves   Strigiformes   Strigidae   Strix   aluco	Strix aluco Linnaeus, 1758	aluco	10698	34814
134	Animalia   Arthropoda   Insecta   Lepidoptera   Nymphalidae   Euphydryas   aurinia	Euphydryas aurinia (Rottemburg 1775)	aurinia	10714	
955	Animalia   Chordata   Aves   Passeriformes   Certhiidae   Certhia   brachydactyla	Certhia brachydactyla C.L.Brehm, 1820	brachydactyla	10733	35010
929	Animalia   Chordata   Aves   Passeriformes   Alaudidae   Calandrella   brachydactyla	Calandrella brachydactyla Leisler, 1814	brachydactyla	10734	21627
1141	Animalia   Chordata   Aves   Coraciiformes   Meropidae   Merops   apiaster	Merops apiaster Linnaeus, 1758	apiaster	10738	34857
888	Animalia   Chordata   Aves   Apodiformes   Apodidae   Apus   apus	Apus apus Linnaeus, 1758	apus	10743	20199
710	Animalia   Chordata   Amphibia   Anura   Hylidae   Hyla   arborea	Hyla arborea (Linnaeus, 1758)	arborea	10749	
1126	Animalia   Chordata   Aves   Passeriformes   Alaudidae   Lullula   arborea	Lullula arborea Linnaeus, 1758	arborea	10750	34851

Showing 1 to 10 of 113 rows    10 ▲ rows per page

1 2 3 4 5 ... 12 >



The screenshot shows a web browser window with three tabs: "google traductor - Busca", "ficha - Diccionario Inglés", and "Cross-Nature". The "Cross-Nature" tab is active, displaying two species cards side-by-side.

**Certhia brachydactyla C.L.Brehm, 1820** 10733



**Hyla arborea (Linnaeus, 1758)** 10749

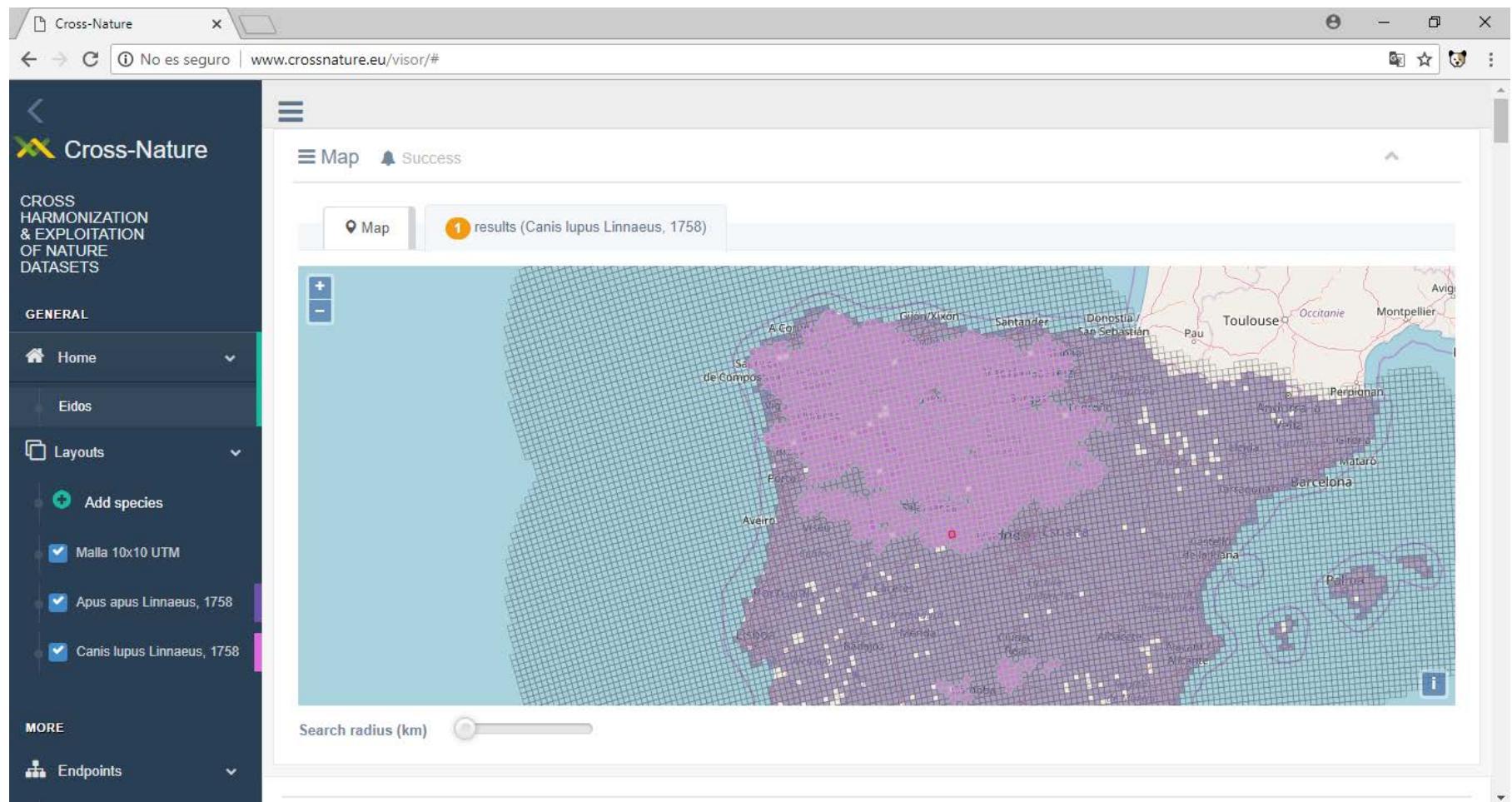


Eidos Eunis

Información taxonómica

Author	Hyla arborea (Linnaeus, 1758)
Classification	Animalia   Chordata   Amphibia   Anura   Hylidae   Hyla   arborea
Kingdom	Animalia
Phylum	Chordata
Class	Amphibia
Order	Anura
Familv	Hylidae





Mejorando el Intercambio de Datos Espaciales para proteger la Biosfera

del 17 al 19 de octubre



# Thanks for your attention

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